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# Development of a program of financial support on enhancing apartment houses maintenance in Korea—Focused on the U.S. and Japanese financial programs for housing maintenance in Korea

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A B S T R A C T

Although Korea has as large a housing stock as other developed countries hold, it has striven to focus on growth-oriented policies by creating new housing units rather than maintaining or rehabilitating existing ones, which has resulted in a few efforts to develop policies to maintain and rehabilitate existing apartment houses. In early 1990, there was a huge construction of 2 million units of apartment housing in the areas around Seoul, such as Bundang and Ilsan. At this point of time when it has been nearly 20 years since the enormous construction, loan programs that enable the existing multiple dwellings to be maintained for sustainable usage are expected to receive much attention.

In this study, the loan programs of New York City and Tokyo Metropolis to maintain multiple dwellings were analyzed as a model for Korean loan programs to support the maintenance of apartment houses, and based on the results of analysis, the directions of organizing the domestic loan programs to maintenance apartment houses were presented. The results are summarized as follows:

First, along with the housing finance policies executed previously in New York and Tokyo, the Korean environment to maintenance apartment houses and policies for maintenance were examined. Then, the necessity for and imperfection of the policies of Korea to support the maintenance of apartment houses were identified.

Second, the targets, benefits, qualification for application and conditions for benefits of the loan programs of New York and Tokyo for maintaining multiple dwellings were researched in order to find the basic framework of the loan programs.

Last, based on the framework of the loan programs of New York and Tokyo, the directions of loan programs and measures to foster housing funds for maintaining apartment houses for Korea were proposed.



**Contents**



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## 1. Introduction

### 1.1. Background and objective of research

There has been a shift among the advanced countries from creation of new housing units to rehabilitation of existing ones because of increased needs of green policies such as energy saving. Much attention has been given to safe re-use of existing houses and sustainable maintenance of their quality, which is different from the previous political structure focusing on housing production. Korea announced its national vision "Low Carbon & Green Growth" in 2008, and the construction market has started to turn from reconstruction and redevelopment to development of sustainable housing units [1,2].

Although Seoul has as large a housing stock as other world metropolises hold, it has focused on growth-oriented policies by creating new units rather than maintaining or rehabilitating existing ones. There have been, thus, few efforts to develop policies to maintain and rehabilitate existing apartments [3]. It has been nearly 20 years[1] since the construction of apartment complexes in Seoul and of the first new towns in Bundang and Ilsan [4–6]. As the needs to repair and maintain those apartments increase, it is expected that loan programs that enable maintenance of the existing apartment houses would be critical to safe use of the existing houses and maintenance of their initial quality.

New York was selected as the top city in the world rankings that were made through evaluation of economic and political stability, and housing conditions and other features of cities[2], and especially the loan programs of New York City have been highly regarded in terms of economic and political stability [7–9]. With a basic framework of the housing policies concentrating on creation and maintenance of housing units, New York has instituted a variety of loan programs to promote the maintenance of its huge housing stock and to accomplish its political goals.

Recently, there has been changed to the keynote of the Japanese policies for housing. The purpose of the policies has moved from provision of housing units to improvement in the quality of life. The society has seen new trends such as low birth rates, aging society and decrease in households. By establishing the Basic Law for Housing Life (2006), the Japanese government has drastically transformed the construction policies to put stress on the market and existing housing stock [10,11]. Complying with these changes, Japan has made efforts to take measures against the aging society and to enact required laws for housing reformation, promotion of secondhand houses and so on. The national policies for housing have turned from new construction to maintenance of existing housing units [12,13].

The United States and Japan have made such viable efforts to improve the quality of housing as accompanied by institutional components. Even though Korea has enhanced welfare policies for housing since 2000, there have been few systematic studies and political efforts so far. The changes in the U.S. and Japanese policies give us suggestions as to the necessity to develop policies.

Therefore, the purpose of this study is to examine the loan programs of New York City and Tokyo Metropolis to maintain multiple dwellings as a model for Korean loan programs to maintain apartment houses, and to present directions for organizing the domestic loan programs to maintain apartment houses.

### 1.2. Research objects and methods

The objects of this study[3] are the loan programs supported by New York City, the United States and by Tokyo Metropolis, Japan to support private multiple dwellings.

Table 1 shows the relevant agencies, which were found in the related literature. The loan programs found through interviews with the people concerned were researched.

Research into the existing literature and interviews with professionals were conducted to obtain related data of Korea, New York and Tokyo, and on-site surveys and interviews were carried out in order to collect more detailed information and verify that information. Especially, the information on the domestic environment in which to maintain apartment houses (Section 2) was obtained through interviews with experts[4] of the government agencies (the Ministry of Land, Transport and Maritime Affairs, Seoul City) and the government-affiliated organizations and research centers (Korea Housing Finance Corporation, Korea Infrastructure Safety & Technology Corporation, Korea Institute of Construction Technology, Korea Land & Housing Corporation). Along with the results of research and interviews, opinions of the experts in the related field were reflected for the directions for Korean loan programs to maintain apartment houses (Section 4).

## 2. Policies of the United States, Japan and Korea to maintain multiple dwellings

To find the ways in which each city implements programs to maintain multiple dwellings, the sections on maintenance in the master plans for housing of Korea, New York and Tokyo and the status of the loan programs implemented by the cities were researched, and then the current state of maintaining apartment houses in Korea and the weakness of that maintenance were studied.

[1] Many of the relevant literature of Korea say that the finishing materials (e.g., tiles) and facilities of a structure shall be repaired or replaced in a 5- to 20-year cycle, and the main structural parts in a 40-year cycle or more.

[2] In the Global Power City Index, the Worldwide Center of Commerce Index, and the Globalization and World Cities, New York City was ranked first, second, and first, and Tokyo Metropolis was ranked forth, third and sixth, respectively.

[3] The objects of this study were limited to Seoul City in Korea, New York City in the United States and Tokyo Metropolis in Japan. Seoul, New York and Tokyo in the study thus represent Korea, the United States and Japan, respectively.

[4] The organizations are representative organs of Korea related to maintenance of housing units, so those who have done related research or are accountable for housing maintenance were interviewed.

**Table 1**
Loan Programs Researched and Organizations interviewed.

| Item | New York | Tokyo | Seoul |
|---|---|---|---|
| Programs | The Participation Loan Program<br>New Partners Programs<br>The Small Buildings Loan Program<br>Home Improvement Program<br>Rehabilitation New Partners Program<br>Article 8A Loan Program<br>Supportive Housing Loan Program<br>Senior Citizen Home Assistance Program | (1) Loan Program of Tokyo Metropolis<br>Mansion improvement work development system<br>(2) Loan Programs of Boroughs of Tokyo Metropolis<br>(3) Loan Programs of Japan Housing Finance Agency<br>Mansion common space reform loan<br>Rental house reform loan<br>Housing remodeling system for senior citizens | None |
| Organizations interviewed | The Department of Building (DOB)<br>The Department of Housing Maintenance and Development (HPD)<br>Community Associations Institute (CAI)<br>Institute of Real Estate Management (IREM)<br>National Apartment Association (NAA) | Japan Building Disaster Prevention Association<br>Building and Equipment Life Cycle Association (BELCA)<br>Tokyo Metropolis Disaster Prevention ·Machizukuri Center<br>Japan Housing Finance Agency<br>Japan Housing Management Association Council<br>Mansion Management Center<br>Mansion Rehabilitation Association | The Ministry of Land, Transport and Maritime Affairs<br>Seoul City<br>Korea Housing Finance Corporation<br>Korea Infrastructure Safety and Technology Corporation<br>Korea Land and Housing Corporation<br>Korea Institute of Construction Technology<br>Long-Life Housing Research Center |

### 2.1. The United States

In the United States, private financial institutions have provided funding for housing while the government has supported people in acquiring houses through guarantees for debtors of housing loans or income tax deduction for interest of the loan [14].

The housing funds of the United States are divided into public funds and private ones. The public housing funds do not mean direct lending by the government, but lending of house purchase prices by private financial institutions through guarantee or insurance by government agencies. In other words, the government does not support directly funds, but lending institutions lend house purchase prices to specially designated low income families and government organizations guarantee the payment. The Federal Housing Administration (FHA) and the Veterans Administration (VA) offer guarantees for low income families suffering from lack of money with a low credit rating.

FHA provides the guarantee service for families that are unlikely to take out home loans, such as low- or middle-income families and first-time homebuyers, while VA offers the service to help veterans acquire homes [15].

The securitization agencies of the United States purchase preferentially bonds guaranteed or insured by such public organs as FHA and VA or require private mortgage insurance in the case of bonds not guaranteed. Through the mortgage insurance system, mortgage bankers can minimize damage from default on the obligation of debtors and so promote mortgage loans, and the borrowers can benefit from reduced down payments and less strict requirements for lending. These systems have helped low income families with low credit ratings to own houses [16].

The secondary mortgage market institutions of the United States include the government organ Ginnie Mac, and the government-sponsored enterprises Fannie Mac and Freddie Mac. These organizations link mortgages to the capital market through securitization of mortgage, so that long-term funds can flow into the housing finance market [17].

Since the value of a house as security determines the amount of a mortgage [18], there has been much financing to repair or maintain houses in order to keep the value of security at a specific level. The guarantee for the funds to maintain housing units has been provided by the government organization FHA or the government-related enterprise Federal Home Loan Mortgage Corporation (FHLMC). If an applicant for home maintenance meets the specified conditions of a New York City loan program, the applicant borrows money from a private bank through the guarantee by the city or FHA [19].

The master plans for housing that have been recently implemented in New York include the 2006-2009 Strategic Plan operated by the Department of Buildings (DOB) and the New Housing Marketplace-Creating Housing for Next Generation (2004–2013) by the New York City Department of Housing Maintenance and Development (HPD).

The funds planned by the New Housing Marketplace-Creating Housing for Next Generation (2004–2013) (hereinafter called "the ten-year plan") are to be used for new construction (35.2%), for maintenance of existing housing units (36.9%), for supportive units (11.8%), and for the expense budget (16.8%) (see Table 2). The budget for maintenance of existing units is larger than that for new construction, which means the city is active in maintaining and rehabilitating houses.

The housing funds of New York City are composed of the city's own budget of 5.8 billion dollars (77.6%), the funds supported by

**Table 2**
The New Housing Marketplace – Creating Housing for Next Generation (unit: thousand dollar).

| Uses | | Total investment |
|---|---|---|
| New construction | | 35.2% |
| Homeownership | $358,000 | |
| Rental | $2,290,000 | |
| Subtotal | $2,648,000 | |
| Maintenance | | 36.9% |
| Homeownership | $92,000 | |
| Rental | $2,685,000 | |
| Subtotal | $2,777,000 | |
| Support housing | | 11.1% |
| | $832,000 | |
| Expense Budget | | 16.8% |
| Anti abandonment, housing education, etc. | $ 1,264,000 | |
| Total | $7,521,000 | |

Source: The New Housing Marketplace – Creating Housing for Next Generation 2004–2013.

the New York City Housing Development Corporation (NYCHDC) of 0.55 billion dollars (7.3%), and those by private partners of 1.1 billion dollars (15.1%). The city's budget and funds from the private sector make up a large share of the funding.

One of the goals of the 2006–2009 Strategic Plan is to develop a building information system so that users can check the history of elevator checks, pipeline checks, violation, application, and permits on the Web. The system has enhanced the safety and efficiency of new construction and maintenance of existing housing units. The main points of the New Housing Marketplace are to develop loan and fund programs in order to provide housing units and solve housing shortage, and to offer new incentives to promote well-organized repair and maintenance of buildings [20–22]. The New York's major master plans for housing are shown in Table 3.

### 2.2. Japan

The housing policies of Japan, after the Second World War, were mainly about government-initiated supply of housing. There were serious housing problems at the time: one-fourth of the population (about 20 million people) lost homes in the war and a lot of families were living in others than houses or under poor, worn-out, and overcrowded conditions. Since Japan had suffered from housing shortage after the war, the government injected public funds through institutional components and struggled to supply housing directly or indirectly.

In 1950, the Government Housing Loan Corporation of Japan (GHLC) was founded according to the Housing Loan Corporation Act, and in 1951, the Public Housing Act was set up so that a legal basis could be prepared for a large-scaled state-sponsored supply of housing. With the Japan housing Corporation founded in 1955, the government carried out housing policies for homeownership, and at last, the rate of homeownership reached 61.2% in 2003[5] [23].

Such housing supply policies of Japan have recently changed. The policies currently focus on quality rather than quantity, and the changes in the social environment such as low birth rates, aging society and decrease in households have caused the housing policies change radically. The public housing system and GHLC, which had been a basic framework of the previous policies, were abolished and privatized, each. Other radical changes were abolition of the Act for Housing Construction Plan which had led measures for housing supply and end of the 5-Year Housing Construction Plan.

Especially the Basic Law for Housing Life (2006) has turned the national housing policies from new construction to improvement in housing amenity and re-use of the existing housing stock [24].

In the master plans for housing that have recently been executed by the Japanese government, the information on maintenance is summarized in Table 4. As for housing maintenance, the Tokyo Metropolis Housing Master Plan stipulates long-life of mansions, smooth process of re-construction, provision of information on housing history and developers, increase in supply of long-life houses, and promotion of proper maintenance and reformation. And, the Master Plan for Housing Life is to support deliberate repair of mansions, maintenance of worn-out mansions, and arrangement of the housing financial market to ensure stable supply of long-term loans [9,17].

The loan programs of Japan can be divided into private and public programs. According to the private loan programs, a person who needs the price for house purchase or repair/maintenance takes out a loan at a commercial interest rate. In the public loan programs, the government, local autonomous entity or Japan Housing Finance Agency (previously Government Housing Loan Corporation of Japan (GHLC)) supports housing funds for qualified people through funding intermediation, guarantee for the loan or payment of interest on the loan. The public loans, as a long-term fixed type, are granted at low interest rates so that families can plan to pay back the loan. The Ministry of Land, Infrastructure, Transport and Tourism entrusted the guarantee service to the Mansion Management Center, and the Center offers the service without requiring collateral.

One of the major organs to support the public loan programs is the Japan Housing Finance Agency. The Agency originates in GHLC established in 1950, and it was founded on the purpose to support public financing. GHLC at first supported only housing construction or rental house construction funds for individuals, but after 1955, expanded the range of beneficiaries of the financing to supply funds for construction or acquisition of installment-sale houses, mid- or high-rise buildings and extension/reconstruction. By granting loans, GHLC has grown as a component of the housing policies on increase in the number of housing units, quality improvement, energy saving and housing for the aging society [25]. In other words, the public loan programs have a political quality: for example, according to a public loan program, criteria for construction and goals of policies are set up so as to ensure high quality of housing.

GHLC invested mostly in public financing at first, and since the 1960s, has increased private housing financing. In 1965, the funding by GHLC was encouraged as a means for business recovery and accordingly, there was a rapid increase in the number of loans. The boost in housing construction contributed to social development and had a great ripple effect on housing-related industries.

As a part of the financial reforms since 1996, the public financial system was reformed. It was in 2001 that a full-scale reform was carried out over GHLC, and it was decided that GHLC should be reorganized into an independent administrative corporation. By the decision, GHLC, which had granted loans through national funds, should raise funds from the private financial market [26,15].

That reformation in the GHLC's financial system was carried out simply on the purpose to reduce the financial burden on the government, and the role and significance of GHLC in terms of housing policies was not reviewed [27]. The complement of public financing to private one is, thus, still an important issue to be discussed for the fields that are difficult to control by private banking institutions, such as steady supply of long-term fixed loans meeting consumers' demands, housing construction to be conducted according to policies, and arrangement of housing conditions.

### 2.3. Korea

Since the Korean War had badly damaged the key industries and housing, the Korean government, like Japan, initiated state-sponsored programs to supply housing units in order to solve housing shortage. The groundwork for supplying houses on a massive scale was laid in the 1970s, including establishment of the Housing Construction Promotion Act, and in the beginning of 1980, the plan to construct 5 million housing units was set up and accordingly there was a huge amount of housing supply. From the middle of 1980–1990 when there was an economic boom in Korea, housing shortage was becoming severe owing to urban concentration of population, so the government announced a plan to construct 2 million housing units in five areas including Bundang and Ilsan (the first new towns).

The construction industry represented a large share of the economy from 1990 to 2000, but the economic crisis over the world caused financial problems to the industry. The policies for housing had to focus on revitalizing the economy. And the new administration at the time pursued welfare and distribution and so committed itself to housing stabilization for the disadvantaged [28]. Since a lot

[5] The housing policies with emphasis on housing supply had positive influence on the restoration work after the war and achieved eye-catching results. The financing by GHLC was provided to 19.09 million units of housing (180 trillion yen), which accounted for 30% of the total housing units.

**Table 3**
Sections on housing maintenance in the New York City's master plans for housing.

| Item | 2006-2009 Strategic Plan | The New Housing Marketplace – Creating Housing for Next Generation (2004-2013) | The New Housing Marketplace–Progress Report 2005 |
|---|---|---|---|
| Goal | To enhance safety, integrity and service, on the groundwork for technology and professionalism | To supply units of affordable housing through new construction and maintenance of existing units | To supply additional affordable housing |
| Period | 2006–2009 | 2004–2013 | Since 2005 |
| Implemented by | New York City DOB | New York City HPD | New York City HPD |
| Plan | Foster construction and establish safety regulations.<br>Prevent corruption among civil servants.<br>Use information technology (IT) in housing construction and maintenance.<br>Train personnel to professionals | Find new lots for affordable housing<br>Develop incentives for construction of housing units<br>Attract private funds for construction of affordable housing<br>Encourage repair and maintenance of public housing | Creation<br>Use city-owned lots to provide housing units<br>Supply affordable housing through large-scaled development<br>Maintenance<br>Develop loan and funding programs to promote maintenance.· Offer new incentives for repair and maintenance of buildings |
| Maintenance | Develop a building information management system on the Web<br>Control the history of elevator checks, pipelines checks, applications, permits and other information on the Web<br>Strengthen safety inspection | Supply loans and funds (about 2.8 billion dollars) to maintain existing units of affordable housing | Develop loan programs to promote maintenance<br>Offer new incentives for repair and maintenance of buildings<br>Formulate new strategies for worn-out buildings |

of people and the small country should be taken into account, most of the construction was for apartments.

The government-initiated policies for housing supply have made it possible to build an enormous number of housing units over a short period of time, and the housing supply ratio is now 110%, which means over-supply of homes [29].

It has been almost 20 years since most of the apartments (80%) were built. The issue on repair and maintenance of housing will be given weight in the future. In addition, the current social changes such as increase in the national income, low birth rates, aging society, over supply of homes and green policies on maintenance of existing housing have required improvement in housing amenity. It is high time for national housing policies to change.

As for the policies on housing maintenance in Korea, the experiences of housing shortage and collapse of structures made us regard "maintenance" as "safety measures," so the government policies have concentrated on new construction and structural safety than maintenance of existing housing.

Table 5 shows the recent master plans for housing. The Second Facility Safety and Maintenance Master Plan includes basic directions to improve the safety and maintenance system and to develop safety and maintenance organizations and technicians and has main goals to improve the safety management system and the repair/reinforcement system and to establish a preventive maintenance system.

The Comprehensive Housing Plan (2003–2012) has the goals on housing maintenance to develop techniques to enhance functions of existing houses, to build houses changeable according to reform or remodeling works and to support the vitalization of housing remodeling. As the percentage of apartment houses and ultra high-rising buildings in the existing housing increases, the Comprehensive Seoul Housing Plan aims for maintenance for long-life housing and for safety of worn-out houses [30–32].

Taken altogether, the master plans for housing by the Ministry of Land, Transport and Maritime Affairs and Seoul City have made some efforts, such as construction of houses changeable according

**Table 4**
Sections on housing maintenance in the housing master plans of Japan.

| Item | Tokyo metropolis housing master plan | Master plan for housing life |
|---|---|---|
| Goal | To ensure safety and comfort of housing and produce sustainable housing that transcends generations | To focus on the housing stock and market, To relate the plan to policies for welfare, community creation, etc., to make elaborate responses reflecting local conditions |
| Period | 2006–2015 (for 10 years) | 2006–2015 (for 10 years) |
| Implemented by | Tokyo Metropolis | The Ministry of Land, Infrastructure, Transport and Tourism |
| Directions of plan | Create a quality housing stock and decent living environment<br>Modify the environment of the housing market<br>Ensure safety of the housing units in the metropolis | Create a quality housing stock and transmit it to the next generation<br>Create decent living environment<br>Modify the environment of the housing market to the environment where various demands of the public for housing are properly satisfied<br>Ensure stability of housing for those who need houses |
| Maintenance | Promote long-life and re-construction of mansions<br>Supply information on housing history and developers<br>Foster housing reformation | Facilitate supply of long-life houses and promote appropriate maintenance and reformation<br>Support deliberate repair of mansions and maintenance of worn-out mansions<br>Organize the housing financial market for stable supply of long-term fixed loans |

**Table 5**
Sections on Housing Maintenance in the Housing Master Plans of Korea.

| Item | The Second Facility Safety and Maintenance Master Plan | Comprehensive Housing Plan (2003-2012) | Comprehensive Seoul Housing Plan (2003-2012) |
|---|---|---|---|
| Goal | To accomplish zero accident and no defect in facilities and improve the safety of facilities | To solve fundamentally problems of poor housing<br>To stabilize the housing market<br>To improve living conditions of the public | To stabilize the housing market in Seoul and enhance the housing welfare for low-income families |
| Period | 2007–2012 (for 5 years) | 2003–2012 (for 10 years) | 2003–2012 (for 10 years) |
| Implemented by | The Ministry of Land, Transport and Maritime Affairs | The Ministry of Land, Transport and Maritime Affairs | Seoul City |
| Directions of Plan | Improve safety management systems<br>Improve repair/reinforcement systems<br>Enhance the technical capacity of facility management entities<br>Liquidate companies with poor records and support outstanding ones<br>Increase the level of technical abilities of safety and maintenance engineers<br>Establish a preventive maintenance system<br>Manage facilities with safety through ubiquitous techniques | Supply housing constantly according to local housing markets and various demands<br>Stabilize the housing market by controlling speculative demands<br>Use efficiently the housing stock<br>Reinforce policies on public housing to stabilize the housing condition of low-income families | Enhance the housing welfare for low-income families by achieving social equilibrium<br>Ensure a quality housing stock<br>Organize housing conditions, considering sustainability and quality of life<br>Professionalize the maintenance system of apartment houses to secure safety |
| Maintenance | Same as above | Develop techniques to reinforce the functions of existing housing<br>Build housing units changeable according to reform or remodeling works<br>Support the promotion of house remodeling | Foster long-life of apartment houses.<br>Rationalize the management |

to remodeling or repair works and promotion of long-life multiple dwellings, but those efforts are just in the research stages and there are few workable measures to practice housing maintenance [33,34].

Except for common loans granted by banking institutions, loan programs are of little concern to the Korean government.

As a result of interviews with the people concerned of Seoul City, policies on maintenance of apartment houses as well as support for the maintenance have been given little attention, and there has been almost zero financial support for private multiple dwellings worn out or likely to have safety problems. The only field that has been supported by the city was public facilities such as amusement facilities and sand on the ground in children's playgrounds of general apartment houses and interlocking blocks on the pavement. Of the remodeling and re-construction works received in Seoul City, remodeling was carried out by 10% and re-construction by 90% by community associations. Even the remodeling works were being regarded as a second choice after re-construction because the qualification for re-construction application has become ever stricter.

The Ministry of Land, Transport and Maritime Affairs was found to have no policies on financial support for housing maintenance, which was researched through interviews (2008) with people of the Ministry. Even though the article 43 of the Housing Act stipulates the Ministry may grant support to apartment houses according to the ordinance, the support is limited to playgrounds, senior citizen communities, replacement of interlocking blocks and others that are not related to repair or maintenance of apartment houses.

The Korea Housing Finance Corporation offers guarantees to people who get loans from commercial banks for rent or house purchase prices and so does not have direct relation to financial support for apartment housing maintenance. The Corporation operates a program to grant guarantees in case a family takes out a loan from a commercial bank in order to maintain the home, but the guarantee (in 2007) was granted merely for four cases (about 48 million won). Actually, the program was proved to be ineffective.

The Korea Land and Housing Corporation has supported only the public rental apartments in the name of housing environment improvement, the support of which was limited to the outside environment improvement sector including painting, new wallpaper and playgrounds, and has given no support to private apartments.

The contracts on apartment housing maintenance in Korea amounted to about 280 billion won, which was 0.69% of the investment in construction (for residential purpose), 37.6 trillion won (in 2009). The investment in maintenance both by the private sector and by the government was found to be very little [35].

### 2.4. General opinions

The housing financing for house purchase or maintenance has been common for long in the United States. There has been an established system to grant loans to those lacking money through strong housing fund guarantee programs to complement one's credit.

The U.S. master plans for housing focus on housing maintenance as well as new construction. So it is expected that maintenance and rehabilitation of existing housing will solve housing shortage and have far-reaching effects like economic revitalization and job creation.

After the Second World War, Japan had founded special organs (GHLC, Japan housing Corporation) and had put public funds in supplying housing in order to solve housing shortage. However, the social changes such as low birth rates, aging society and decrease in households led to enactment of the Basic Law for Housing Life, according to which the keynote of the housing policies has changed from quantitative increase to amenity and maintenance of existing housing. Like the United States, Japan has supported those with low credit ratings through the guarantee by the government (guarantee by an organization entrusted by the government). The current master plans for housing hold long-term fixed loans with low interest rates as an effort rather to maintain the existing housing than to construct new homes.

The rapid economic growth and state-initiated housing supply of Korea have resulted in over-supply of homes with the housing supply ratio reaching 110% [36]. The changes in the social environment such as low birth rates and aging society and the demands of

the public on improvement in the quality of housing have required the housing policies to change.

Apartment houses are holding an important position in the housing life: they occupy nearly 52% in the total housing units. It is high time to take full measures to maintain apartment houses because it has been about 20 years since the construction of apartment complexes in Seoul and of 2 million units in the new towns including Bundang and Ilsan. We need to make decisions on sustainable maintenance of those housing units.

The government and academic circles, however, have made few efforts to maintain apartment houses and to actualize loan programs, such as research into foreign financial programs, promotion of government guarantees to complement the low credit ratings of low-income families, and financing for support.

Section 3, thus, introduces the loan programs of New York City and Tokyo Metropolis and presents the directions of organizing Korean loan programs to maintain apartment houses.

## 3. Loan programs of New York and Tokyo

To present the directions in which to establish Korean loan programs to maintain apartment houses, the loan programs of New York and Tokyo were examined as to targets, benefits, qualification for application and conditions for benefits. Since most of the loan programs consist of the four sections (targets, benefits, qualification for application and conditions for benefits), the programs were analyzed according to the sections.

### 3.1. New York's loan programs

New York City pays part of interest of loans through the loan programs and so keeps interest rates low. The loan programs include the Participation Loan Program, New Partners Programs, the Small Buildings Loan Program, Home Improvement Program, Rehabilitation New Partners Program, Article 8A Loan Program, Supportive Housing Loan Program, Primary Prevention Program and Senior Citizen Home Assistance Program. The loan programs are mostly for small-scaled multiple dwellings, low-income families, the old and the handicapped [37–48].

(1) Targets of loan programs

The New York City loan programs target small-sized buildings (one to twenty families), multipurpose buildings with vacancies and buildings under inadequate living conditions, and so on. The Participation Loan Program supports interior maintenance of a multipurpose building with more than twenty families; New Partners Programs support interior maintenance of a multipurpose building with less than twenty families; the Small Buildings Loan Program targets repair and internal maintenance of a building with one to twenty families or a building half of which is used for the residential purpose.

Home Improvement Program deals with buildings under poor conditions that require repair or replacement of bricks, roofs, pipelines, boilers or electric wires; Rehabilitation New Partners Program targets a small-sized building with less than 4 families or a 1- to 20-family building with vacancies under poor living conditions.

Supportive Housing Loan Program is to support maintenance of buildings accommodating the old, homeless or handicapped; Senior Citizen Home Assistance Program supports maintenance of a building occupied by an owner older than 60 years, with rental homes for one to three families.

(2) Benefits of loan programs

The New York's loan programs generally support part of the interest on a loan for 10–30 years so that the interest rate is kept at 1–3% and lends each applicant about 10–40 thousand dollars. Property tax abatement or exemption is granted by some of the financial programs.

The Participation Loan Program lends a family 10 thousand dollars for up to 30 years at a 1% interest rate, and provides J-51 property tax exemption. New Partners Programs lend 40 thousand dollars at most, to each family for 30 years at a low interest rate. The Small Buildings Loan Program provides a loan for up to 30 years at a 1% rate of interest, along with J-51 or 421-b property tax exemption. Home Improvement Program lends a family thirty thousand dollars at most, for up to 10 years at a 2.5 to 5% rate of interest according to income levels of applicants.

Rehabilitation New Partners Program lends each family 15 thousand dollars for up to 30 years at a low rate of interest. Article 8A Loan Program lends 35 thousand dollars for 30 years at a 3% interest rate and provides property tax exemption.

Supportive Housing Loan Program, which is intended for the handicapped and homeless, lends a family 90 thousand dollars for up to 30 years. In case a non-profit entity meets legal requirements for 30 years, for the homeless, handicapped or low-income people, the entity is exempted from paying the principal and interest. Senior Citizen Home Assistance Program, which is for the old, lends 30–40 thousand dollars at a 0–3% interest rate according to one's age.

(3) Qualification for loan program application

The loan programs of New York do not require specific qualification if an applicant meets the conditions of a loan program on targets. Only a consent form that the applicant agrees to be under the control of the NYC Rent Stabilization system is required in some of the programs. The Participation Loan Program, New Partners Programs, the Small Buildings Loan Program, and Rehabilitation New Partners Program call for such a consent form, while Home Improvement Program, Article 8A Loan Program and Supportive Housing Loan Program do not require special conditions.

(4) Conditions for benefits

Except the programs for the old or handicapped, the financial programs of New York ask the beneficiaries to be under the control of the NYC Rent Stabilization system[6] and some programs call for beneficiary's donation of part of project costs. The Participation Loan Program require a beneficiary to be controlled by the NYC Rent Stabilization system, while New Partners Programs ask a beneficiary to be under the control by the rent stabilization system and, if the housing is used for profit, to donate 10% of project costs or if it is for non-profit purposes, to donate 2% of project costs.

The Small Buildings Loan Program requires the control by the rent stabilization system and donation of 2 to 10% of costs. Rehabilitation New Partners Program also has the condition on the control by the system. Article 8A Loan Program provides benefits only for buildings occupied by low income people. The programs for the old or handicapped do not stipulate specific conditions for benefits.

### 3.2. Tokyo's loan programs

The loan programs of Tokyo can be divided into three: the programs by Tokyo Metropolis, by the boroughs of Tokyo Metropolis and by Japan Housing Finance Agency. The loan programs of Tokyo Metropolis and its boroughs include intermediation of financing and support of the interest on loans for housing maintenance. The loan programs are classified into intermediation of housing repair

[6] The Rent Guidelines Boards of New York City decides the limit of rent increase rates every year so as to control the increase.

financing[7] and housing loan for the old or handicapped. Japan Housing Finance Agency operates loan programs including mansion common space reform financing, rental house reform loans and housing reform system for senior citizens [49–53].

(1) Targets of loan programs

The mansion reform work support system of Tokyo Metropolis targets homes with a community association borrowing loans from Japan Housing Finance Agency. Most of the programs by the Tokyo boroughs support houses in need of repair, extension/remodeling or improvement in living conditions. The programs for the old or handicapped are for people older than a designated age or the mentally or physically handicapped.

The mansion common space reform financing by Japan Housing Finance Agency is for reform of common space or reform with earthquake-resistance work. The rental house reform loan targets repair, extension, remodeling and earthquake-resistance works. The housing reform system for senior citizens supports the reform work of a house occupied by the home owner older than 60 years at the time of loan application.

Taken altogether, the loan programs of Tokyo support homes borrowing loans from Japan Housing Finance Agency, houses in need of repair, extension/remodeling or improvement in living conditions, the old or handicapped, and houses with common space requiring reform works and those in need of earthquake-resistance work.

(2) Benefits of loan programs

The loan programs of Tokyo Metropolis and its boroughs include mansion reform work financing, intermediation of housing repair financing and loan programs for the old or handicapped, and the programs of Japan Housing Finance Agency include mansion common space reform financing, rental house reform loan and housing reform system for senior citizens.

The mansion reform work financing of Tokyo Metropolis limits the amount of a loan up to the sum of the loan that a community association gets from Japan Housing Finance Agency, and Tokyo Metropolis supports part of the interest so that the interest rate designated by Japan Housing Finance Agency is kept at 1%.

The benefits of the loan programs of the Tokyo boroughs are different per borough according to local characteristics. The loan programs can be divided into intermediation of housing repair financing and programs for the old or handicapped. Through the intermediation of housing repair financing, 100 thousand yen to 10 million yen is lent for 3–30 years and the concerned borough pays up to 4% of the interest on the loan.

The mansion common space reform financing of Japan Housing Finance Agency lends up to 80% of construction costs for 1–10 years at a 1.64% interest rate in the case of reform not including earthquake-resistance work or at a 1.44% rate for reform with earthquake-resistance work. The rental house reform loan is to offer the smaller amount between 80% of actual construction costs and the highest limit of the loan[8]. The interest rate at the time of application for a loan program is the interest rate on the loan, and the rate is chosen[9)] between the rate for more-than-ten-year redemption (1.64%) and the rate for up-to-twenty-year redemption (2.65%). The house reform system for senior citizens provides a loan smaller between 10 million yen and the top limit of the guarantees designated by the Senior Citizen Housing Support Center.

The Tokyo's loan programs are divided largely into intermediation of housing repair financing and programs for the old or handicapped even though most of the programs are intermediation of housing repair financing. The loan programs generally hold the ten-year term of redemption, but a few of them are long-term (30 years) programs. Most of the loan programs support partial interest on loan, and the amount of interest supported becomes larger in the case of the programs for the old or handicapped.

(3) Qualification for loan program application

The mansion reform work financing of Tokyo Metropolis requires meeting the conditions that there should be a community association for the mansions in fire-proof construction, located in Tokyo Metropolis, that the loan according to the "reform of common space of mansions" designated by Japan Housing Finance Agency is offered and that the mansion management center guarantees the beneficiary's obligation.

The Tokyo boroughs stipulate the qualification on age, income level, living in a concerned borough for a specific period and so on. Since an applicant should be old enough to pay back a loan, the applicant is required to be older than 20 years of age and younger than 75 years of age. As for income level, the applicant should make more than a designated amount of money per year (from 5 million yen up to 12 million yen) or should have a sufficient amount of income. Some boroughs stipulate the conditions on location and period of living.

The mansion common space reform financing of Japan Housing Finance Agency requests arrangement of the rules and agreement of a community association on reform. The rental house reform loan does not ask for certain conditions if the applicant meets the conditions on target. The house reform system for senior citizens does not have specific conditions if the beneficiary is older than 60 years at the time of application for a loan.

(4) Conditions for benefits

The mansion reform work financing system of Tokyo Metropolis does not require conditions for benefits, and the programs of the Tokyo boroughs and Japan Housing Finance Agency also do not ask applicants to meet certain conditions if they satisfy the conditions on targets.

### 3.3. General analysis

The targets, benefits, qualification for application and conditions for benefits of the New York and Tokyo loan programs are summarized in this section as the reference for loan programs to be applied in Korea. The framework of the system to maintain apartment houses for Korea can be based on the characteristic features of the loan programs.

The targets of the financial programs of New York and Tokyo are mainly general repair works, poor living conditions, safety including earthquake-resistance and the socially weak like the old. New York, as a multiracial society, has a lot of migrants, and so has supported through the financial programs the housing under poor living conditions. The Tokyo's programs are intended to handle the safety for the public, such as repair work for earthquake resistance. Both the two cities target the socially weak such as the old or handicapped.

The benefits of the programs are divided largely into intermediation of housing repair financing, support of interest on a loan, and tax incentives. All of the benefits are granted by the New York's programs, while intermediation of financing and support of interest are provided by the Tokyo's programs.

[7] The names, scale of financing, and term of redemption of the loan programs are varied per Tokyo borough, but the programs are similar to one another.

[8] The mansion management center guarantees up to 1.5 million yen per family, which is the highest limit of the loan.

[9] The interest rate is as of September 2008, and the rate is changeable according to the time of benefits.

The qualification for application is not particularly stipulated in the New York City programs, but the Tokyo programs have conditions on age, income level and guarantee for applicant's obligation, and others relating to the policies of Tokyo Metropolis such as existence of a community association.

New York has the condition for benefits that a beneficiary of the financing should be under the control by the rent stabilization system by which the city puts the limit on rent increase. The condition of the programs reflects the characteristics of a city with lots of private rental houses.

Fannie Mac and Freddie Mac in the United States and a specialized organ in Japan, that is, Japan Housing Finance Agency have expanded the range of targets of the housing loan programs through intermediation of financing and governmental guarantee and have made it possible to supply constantly fixed loans at low interest rates, regardless of economic conditions.

The characteristics of the New York and Tokyo financial programs are summarized in Table 6.

## 4. Proposal of directions of loan programs to maintain apartment houses for Korea

With the features of the loan programs of New York and Tokyo discussed in Section 3, the directions of Korean loan programs to maintain apartment houses are proposed in this section.

### 4.1. Proposal of directions of loan programs

The New York's loan programs target mostly houses in need of repair, those under poor living conditions, the aged, and the handicapped, while the Tokyo's programs deal with housing in need of repair, housing under poor living conditions, earthquake, the old, and the handicapped. As the main targets of the Seoul's programs, the old, apartment houses under poor living conditions and houses in need of repair are considered. There has been a rapid increase of the old in Korea: the increasing rate of the aged in Korea was ranked first among the OECD-member countries [54]. Loan programs for senior citizens should be given priority. Seoul City is infamous for its high prices of housing, so low-income families and the other socially weak are compelled to live under poor living conditions that might cause threat to the safety of the dwellers. The housing under poor living conditions, thus, should be taken into account. The financing for housing units in need of common repair works should be limited to a certain point because of the limited financial resources of the government.

In addition, it is necessary to decide if loan programs for repair/maintenance of facilities, pipelines and finishing materials (e.g., outer walls, tiles) are required because about 80% of the apartment houses in Korea are 20-year old or less.

Given limited financial resources of the administrative agencies, it is better for private commercial banks to provide intermediation of financing or support of partial interest on a loan than for public agencies to do. But, the direct financing by the city can be considered in the event of threats to the safety of housing or serious problems in living conditions. The limit of supported interest on a loan is set up so that interest rates are kept low. Especially the old and the handicapped should be granted more support of interest on loan.

The funds borrowed from private commercial bank can be guaranteed by Korea Housing Finance Corporation (a government-supported organization) or other organs entrusted with the guarantee service. In that case, it is needed to simplify the procedure and qualification for application, and to promote incentives such as support of interest on a loan. And, subsidies can be granted for charges for guarantee.

As for the qualification for loan program application, a consent form of a community association and a guarantee for the beneficiary's obligation are required. Considering the necessity to promote housing maintenance, no conditions for benefits are needed, but according to policies of the government, corresponding conditions can be set up. The proposed loan programs for Korea are summarized in Table 7.

### 4.2. Measures to facilitate financing to maintain apartment houses

Since there has been no experience of housing maintenance financing supported by the government, such financing is still in the beginning stages. People in a stable financial situation, of course, can do repair or maintenance works with their funds, but middle- or low-income families and the old, who account for a considerable share of the population, need to benefit from the government's efforts, that is, financial support.

Experts were interviewed[10] in order to find requirements to facilitate the financing for housing maintenance for Korea. As a result of the interviews, they suggested, as the requirements, a guarantee system to complement the credit risk of debtors, legal provisions on financial support by the country and local governments, and constant and stable financing. Based on the requirements, the measures to foster financing for housing maintenance are proposed as follows.

First, like the programs of the United States, reliable guarantees by the government or its organs are needed to complement the credit risk of individual debtors. Through the guarantee, private banks can operate safely loan programs. The government or local autonomous entities need to support part of interest on loans.

The guarantee by the government helps decrease the down payment of debtors and so contributes to easing the requirements for lending, by which low-income families can benefit with ease from loan programs.

The system is same as that of the programs of the United States and Japan. Housing financing is composed of lending by private banks and guarantee by the government to relax requirements for lending.

Even though Korea Housing Finance Corporation operates such guarantee service, the service is seldom used because of little promotion and strict requirements for lending. It is necessary to simplify the requirements and offer incentives such as support of interest on loans. To develop and foster financial programs on housing maintenance, we need to formulate more detailed strategies.

Those who are unlikely to meet the qualification for loan or guarantee application, such as the handicapped, the old with no means to make money and single parent families need to be granted direct funds or other financial support by the government because it is hard for them to take out loans from private banks.

Second, tax exemption for a loan for housing maintenance can promote housing financing. After the Great Depression during the 1930s, the United States had struggled to recover the economy by promoting housing funds [55], and in Europe, housing maintenance was often utilized in revitalizing the economy, invigorating local communities and creating jobs [56].

Of the apartment houses in Korea, about 80% (9.9 million families over the country, 1.8 million families in Seoul) are 20-year old or less. Fostering the financing on housing maintenance will result in positive effects such as revitalization of the economy and job creation.

[10] As said in Section 1, the opinions of experts were obtained through visits and by email to government agencies and related research centers.

**Table 6**
Financial Programs of New York and Tokyo.

| Item | New York | Tokyo |
|---|---|---|
| Main targets | Small-sized buildings (mostly, one- to twenty-family buildings)<br>Multipurpose buildings (residential + commercial) or multipurpose buildings with vacancies<br>The old or handicapped | (1) Tokyo Metropolitan Government<br>Mansions in need of repair (for earthquake-resistance, etc.)<br>(2) Boroughs of Tokyo Metropolis<br>Houses in need of repair (for earthquake-resistance, etc.)<br>The old or handicapped<br>(3) Japan Housing Finance Agency<br>Common space in mansions (including earthquake-resistance repair)<br>Rental house repair<br>The aged |
| Benefits | Loans (with a thirty-year term of redemption) + partial support of the interest + tax exemption or abatement | (1) Tokyo Metropolis<br>Pays part of the interest of the loan from Japan Housing Finance Agency<br>(2) Boroughs of Tokyo Metropolis<br>General Public: Intermediation for financing + partial support of the interest<br>The Aged, etc.: loans directly to applicants + partial support of the interest<br>(3) Japan Housing Finance Agency<br>Common Space in Mansions: loan (80% of construction costs)<br>Rental House Reform: the lower sum between 80% of construction costs and 1.5 million yen<br>The Aged: Up to 10 million yen |
| Application qualification | No qualifications required if the applicant is a building owner who is able to pay back the loan. | (1) Tokyo Metropolis<br>There should be a community association for for-sale mansions in earthquake-proof construction.<br>One should get a fund from the mansion common-space reform program.<br>The mansion management center guarantees the obligation of a beneficiary.<br>(2) Boroughs of Tokyo Metropolis<br>One's age, income level, residence in a concerned area for a specific period<br>(3) Japan Housing Finance Agency<br>Not stipulated |
| Conditions for benefits | Under the control of the NYC Rent Stabilization System<br>Donation of 2–10% of project costs | Not stipulated |

Third, it is required to establish a legal basis on which administrative agencies can implement actively financial support. The basis can be prepared by modifying the Housing Act. There has been a limit in financing for housing maintenance because no concrete provisions have been formulated so far. As shown in Table 8, Article 43 (Entities of Management) of the Housing Act needs to be modified so that administrative agencies can take positive measures on housing maintenance, including financial support. It is expected that based on the revised Act, local autonomous entities or other administrative agencies will grant

**Table 7**
Proposal of loan programs for Korea.

| Item | Description |
|---|---|
| Main targets | The old and the handicapped (priority)<br>Houses in poor living environments<br>Houses in need of repair |
| Benefits | Intermediation service for financing and support of loan interest by private commercial banks (priority)<br>Direct financing and support of part of loan interest by the city<br>Guarantee: a loan is guaranteed by Korea Housing Finance Corporation or other organs entrusted with the guarantee service, and the charges for guarantee can be supported by subsidies. |
| Application qualification | Opinions and a written agreement of a community association, and a guarantee for obligation are required. |
| Conditions for benefits | For the purpose of promoting and vitalizing housing maintenance, the programs do not require specific conditions for benefits, but according to political directions, corresponding requirements can be specified. |

**Table 8**
Revision of Housing Act.

| Present | Revised |
|---|---|
| Article 43 of the Housing Act: A local government head may support part of the costs required for an entity to manage apartment houses, according to the ordinance of the local autonomous government. | Article 43 of the Housing Act: A local government head may *grant financial support or take other proper measures required for an entity to manage, repair, maintain or maintain apartment houses*, according to the ordinance of the local autonomous government. |

tax exemption or subsidies for interest on loans for housing repair/maintenance.

But, what is fundamentally required is that the keynote of the national policies on housing turns from new construction to maintenance of existing housing and improvement in the quality of life and, based on the change, new regulations are formulated.

Fourth, the government needs to initiate investment in public structures and public rental houses so as to promote housing maintenance and create the environment on maintenance. In such environment, construction firms can acquire experience and techniques on housing maintenance, and those public efforts will result in job creation and improvement in living conditions of low income families.

Next, it is required to raise funds on housing maintenance. According to the New York City's plan, 'the New Housing Marketplace – Creating Housing for Next Generation (2004–2013)', the planned financing is prepared from the city's budget, funds of related organizations and private sectors. The New York City's budget, which accounts for the largest share of the financing, is likely to be influenced greatly by economic changes, so it is important to retain constant financial resources. Considering continuity and stability of financing, the measures to raise funds are proposed as follows:

a) A certain rate (about 1%) of costs for new construction is raised so that it can constitute the loans or subsidies for housing maintenance. It is thought that the raised money will be stable funds for housing maintenance. For example, France collects 1% of construction costs and uses it as financial resource to maintain and maintain cities. Five billion euros have been invested in such activities so far [57].
b) The national housing fund can be utilized. The fund has been used in construction of rental houses, loans for rents or house purchase prices, and so on. The fund now amounts to 27.7 trillion won (as of 2010). Since the fund has a strong public quality, it can be granted to those in desperate need of national support, such as the old and the handicapped. If only 1% of the fund is used as loans or subsidies for housing maintenance for those socially weak, it will have substantial political effects on welfare and job creation.

Last, there are necessities to have organizations specialized in monitoring closely financial support and developing policies. Financial support for housing maintenance has been of little concern in Korea. It is, thus, necessary to designate a particular agency and to form a specialized organization in order to minimize trials and errors that might happen owing to little experience and to maximize the effectiveness of the financial service.

## 5. Conclusion and further research

Here, the directions in which to formulate the Korean loan programs on maintenance of apartment houses were presented through analysis of the loan programs of New York and Tokyo on maintenance of multiple dwellings.

It has been nearly twenty years since the construction of apartment complexes in Seoul and in new towns around Seoul. It is high time to discuss how to rehabilitate or maintain existing housing.

Based on the New York's and Tokyo's loan programs, the Korean loan programs on apartment housing maintenance were proposed. Following are the results of the study.

First, by referring to the experience of the United States (New York City) and Japan (Tokyo Metropolis) on maintenance of multiple dwellings and financial policies on housing, the situation of maintenance of apartment houses and policies on maintenance in Korea were studied. Through the study, the appropriateness and imperfection of the efforts to maintain apartment houses in Korea were found out.

Second, the targets, benefits, qualification for application and conditions for benefits of the New York's and Tokyo's loan programs to maintain multiple dwellings were examined in order to understand the framework of the programs.

Last, based on the framework of the loan programs of New York and Tokyo, the directions of the Korean loan programs and the measures to vitalize the financing on housing maintenance, which is still in the beginning stages, were proposed.

Even though this study proposed directions in which to formulate the financial programs on apartment housing maintenance, there have been few studies and incomplete perception on financial programs on maintenance of apartment houses, and only the U.S. and Japanese loan programs were reviewed as main models. For future thorough research, the financial programs on housing maintenance of Europe as well as those of the United States and Japan need to be reviewed. In addition, pilot projects are necessary for the proposed financial programs to settle down to the Korean policies on housing. Pilot projects and further research of various cases should be conducted so as to examine in detail measures to raise funds for the Korean financial programs, the scale of the financing, guarantees by the government, formation of specialized organizations, and so on. It is hoped that such studies will be helpful in promoting maintenance of apartment houses in Korea.

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